

## NATIONAL WILDFOWL COUNTS

### THE 1990 NATIONAL CENSUS OF PINK-FOOTED AND GREYLAG GEESE IN BRITAIN

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#### SUMMARY

The 31st British census of Pink-footed and Icelandic Greylag Geese took place in autumn/early winter 1990. Two discrete counts were undertaken in Britain, one in October and one in November, and some counts were made in Iceland; breeding success was estimated in Britain. November produced the highest totals of both species in Britain, despite poorer count conditions than those in October, and grand totals of almost 195,000 Pink-feet and 115,000 Greylags were recorded. These represent the highest totals yet recorded for the census, but may still underestimate true population sizes. Few geese were present in the areas of Iceland surveyed during this period, and consequently the estimates of total populations were not adjusted. Both species bred well in 1990, with 21.5% and 20.7% young, and brood sizes of 2.22 and 2.51 birds/pair, for Pink-feet and Greylags, respectively. The distribution of each species across regions was examined, and the sites supporting the highest numbers of geese highlighted. It is proposed that two counts should be undertaken in 1991 as a repeat of this year's census, and that more frequent counts should be undertaken at key sites to assess their importance more accurately and to investigate the phenology of migration.

#### INTRODUCTION AND METHODS

The 31st consecutive national census of Pink-footed *Anser brachyrhynchus* and Greylag Geese *A. anser* in Britain took place in autumn/early winter 1990. The methods used were similar to those of previous years, with most observations being made by volunteer counters, and the majority of geese being counted at roost sites. Also, as usual, additional counts were made over the 2-11th November by M.A. Ogilvie on behalf of the WWT. He, together with a small number of experienced observers, assessed breeding success by recording the proportion of young birds and brood sizes in sample flocks. Though similar to previous censuses in these respects, the 1990 census differed in three main ways: (a) coverage was extended to include some parts of south-west Iceland, representing areas known to hold large numbers of geese in spring; (b) in Britain, two discrete counts were undertaken instead of just one; and, (c) coverage in Britain was improved and new 'Goose Count Coordinators' were recruited to improve the organization of goose counts in particular areas.

In Iceland, counts were undertaken between the 14th September and the 11th November. In the south-west, extensive coverage of the most important lowland areas was carried out on 20th October and 11 November to coincide with the survey in Britain, mainly along the coast from Selfoss to Hvalsvoillur, and inland from Selfoss to Tungufell. Other observations were made in the Andakill/Borgarhreppur lowlands, north of Reykjavik, and casual information was collated from the south-east (near Hofn), the eastern lowlands (around Egilsstadir) and from an aerial census (whilst surveying Whooper Swans *Cygnus cygnus*) of the western and southern lowlands. Thus extensive areas were checked, albeit on a casual basis.

In Britain, the 1990 census consisted of two distinct counts: the normal November count, conducted over the 10/11th, was supplemented by an earlier count on the 20/21st of October, in order to investigate the optimal time to census each species. Such action was recommended by Kirby (1990) who reviewed the methodology and coverage achieved for the census and discussed current difficulties in achieving accurate total counts of the two species. Field evidence from central and south-east Scotland suggested that early to mid-November was no longer the best time to census Pink-footed Geese (Newton *et al.* 1990). This species is certainly more concentrated shortly after arrival than is the case later in the season, and generally occupies sites which are well counted, the use of which may be more predictable than later in the season. The aim, therefore, was to carry out two counts in 1990 to see which provided the highest national estimates for Pink-feet.

In Britain, 144 areas were checked for geese in October and 192 in November, coverage for the latter count being certainly the most complete ever. The large difference between the number of sites counted in the two months is mainly due to coverage of lesser-used sites in south-west and western Scotland, checked by P. Shimmings during the 10th to 15th November. That virtually no birds were found at these additional sites permits direct comparison of count totals for the two months. In comparison with the 1989 census, the coverage achieved in 1990 was markedly better in many areas, particularly in Highland, Grampian and Strathclyde regions.

Here we provide a brief overview of the results of the 1990 census; more detailed information is held within the WWT's databases at Slimbridge.

## WEATHER CONDITIONS

The conditions for counting over the census weekend in October were generally satisfactory, with the majority of observers indicating that good counts had been made. In contrast, this was certainly not the case over the November count weekend: localised patches of fog, mist and heavy rain, resulting in poor visibility, reduced counting accuracy in a number of areas, particularly in SW Scotland, in east and central Scotland and around the Moray Basin.

## RESULTS AND DISCUSSION

### *Total numbers*

#### Iceland:

Table 1 provides a breakdown of the counts from south-west Iceland during the September to November period. Although relatively few sites were visited, these are important spring staging areas and represent the only agricultural land with arable crops, and hence only here can the geese derive high energy food in artificial habitats (A.D. Fox, pers. comm.). However, the counts revealed few geese, especially in October and November. Contacts there, and elsewhere in Iceland, considered that almost all geese had left Iceland by the last days of October (J.-O. Hilmarsson, in litt.), except for a few late and some wintering Greylags in the south-east, near Hofn (perhaps 30-40 birds), and at Tjornin in Reykjavik (approximately 500 birds). Some observers in Iceland consider that Pink-feet very rarely stop in the lowlands on autumn migration but fly straight from their highland breeding areas to Britain. Greylags, however, are thought to have a short stop in the lowland areas but are uncommon there in September and October. Our attempts to find large numbers of Pink-feet or Greylags in Iceland in October/November 1990 were thus thwarted. Whether large numbers of geese could be present elsewhere in Iceland is uncertain, though it seems unlikely given that they are not present in any great numbers in their favoured staging areas.

Table 1. Numbers of Pink-footed and Greylag Geese counted at various localities in south-west Iceland, September to November 1990.

		Pink-footed	Greylag
Andakill/Borgarhreppur	14 Sep.	0	77
	23 Sep.	6	159
	24 Oct.	2	26
Olfus	1 Oct.	0	155
	9 Nov.	0	0
Selfoss-Tungufell	25 Sep.	322	466
Olfus-Holt	22 Sep.	0	466
	20 Oct.	1	213
	11 Nov.	0	0
Markarfljot in Fljotshlid	28 Oct.	200	0

#### Britain:

In Britain, the count of 194,752 Pink-footed Geese in November 1990 (Table 2) is the largest total yet recorded and presumably reflects both improved coverage and coordination, and a real increase in population size. This compares with 182,969 recorded in November 1989 (Kirby & Salmon 1990). However, the 1990 total is still likely to be an underestimate. A number of observers abandoned counts due to fog but noted the presence of calling birds. In addition, several observers noted that shooting on or just prior to the count weekend appeared to have caused a temporary reduction in numbers. Relatively low counts were obtained from a number of sites in November, notably on the Solway and Montrose Basin. At the latter site, fog prevented good counts being made and resulted in at least 8,000 fewer birds being recorded than were known to be in the area (R. Goater, in litt.). It seems likely, therefore, that even the November count of Pink-feet underestimated the population by at least 10,000 birds.

The October total count of Pink-feet constituted *ca.* 90% of that recorded in November. However, of note is a count of almost 30,000 geese at the Loch of Strathbeg prior to a shoot, which may have been responsible for the fact that only half of this number was present on the October count date (J. Dunbar, in litt.). It is possible that these birds were simply missed in the survey, if using adjacent roosts, rather than having genuinely moved south. This was perhaps the case as 37,100 birds were recorded at Strathbeg in November, suggesting that they had remained in the area. Furthermore, only 9,000 were recorded at Montrose Basin on the October count date, though there had been 15,000 a few days earlier. Thus, the October count was also likely to have underestimated the numbers present at that time, perhaps by as many as 20,000 birds.

A total of 114,678 Greylags was counted in November (Table 2) which also represents the largest total yet recorded in Britain. As with the Pink-footed Goose, this is likely to represent an underestimate of the true population size, due to poor weather conditions in some areas and disturbance. This total places the population back on the steady increase observed in recent years, an increase that was apparently interrupted in 1989 when only 83,577 birds were recorded (Kirby & Salmon 1990). For Greylags, only a little over two-thirds of the November total had apparently arrived by the October count date.

#### *Regional distribution within Britain*

Table 2 provides a regional breakdown of the census results, and Table 3 shows the gross regional distribution of the geese, given as the proportions of the total counts in each of seven large regions.

In October, the majority (*ca.* 62%) of Pink-feet was found in three regions: Perth & Kinross, the Lothians and Borders (Table 2). By November, the proportion counted in these regions had dropped (to only *ca.* 37%), whilst numbers had increased markedly in Banff & Buchan, Lancashire and Norfolk and, to a lesser extent, Caithness. The results confirm that Pink-feet are more concentrated in October than in November.

It is certainly beyond the scope of this census as it stands to do more than speculate as to whether the increased numbers of Pink-feet in NE Scotland (from 9.5% in October to 21.6% in November, Table 3) represents movement of birds north from more southerly concentrations in October, genuine arrival of new birds into Britain between count dates or, as suggested, undercounting resulting from temporary dispersal due to disturbance. As it seems likely that the vast majority of the Pink-feet had arrived in Britain by mid-October 1990, the second option seems unlikely, but either or both of the other factors may apply. Also, it is to the credit of the counters that in November, when the geese are more widely dispersed, a relatively complete census was still achieved.

Greylags were more widely dispersed than Pink-feet, with many more regions contributing relatively large numbers of birds to the grand totals in both months (Table 2). However, there were notable concentrations, with Ross & Cromarty/Sutherland, Moray and Perth & Kinross together holding just over 53% of the Greylags counted in October. In November, each of these regions individually contributed relatively fewer to the total count (21.8% in total, Table 2), and there were obvious increases in NE Scotland as a whole and in SW Scotland/NW England (Table 3). Elsewhere, Greylag numbers remained relatively constant between October and November when compared with the changes apparent for Pink-feet.

Table 2. Total numbers and regional distribution of Pink-footed and Greylag Geese in Britain in October and November 1990.

	No. of areas checked		Pink-footed		Greylag	
	Oct	Nov	Oct	Nov	Oct	Nov
Shetland	-	-	-	-	-	-
Orkney	3	4	6	120	1,040	3,970
Western Isles	1	0	1	-	0	-
Caithness	6	6	0	3,064	0	2,860
Ross & Crom./Suther.	13	13	20	330	20,342	8,550
Inverness/Nairn	6	7	530	410	2,720	9,790
Badenoch & Strathspey	1	1	37	8	523	1,592
Moray	3	3	47	280	9,240	7,250
Banff & Buchan	2	2	15,900	37,110	130	3,650
Gordon/Aberdeen	3	3	2,230	3,600	7,120	21,890
Kincardine & Deeside	1	1	20	610	6,610	15,990
Angus/Dundee	101	11	4,930	15,370	4,940	3,980
Perth & Kinross	13	21	48,400	31,800	11,270	9,260
Central	5	6	8,250	5,690	848	2,430
Fife	6	7	1,190	5,350	60	2,920
Argyll & Bute	4	9	0	4	1,070	4,981
Glasgow area*	6	28	0	24	1,030	2,890
Clydesdale	2	2	5,000	5,200	250	190
Wigtown	4	10	40	40	1,750	2,370
Stewartry	5	5	2	1	910	930
Nithsdale	2	3	0	0	0	70
Annandale/Eskdale**	2	4	7,260	2,780	432	598
Lothians	10	9	28,780	20,690	1,212	2,120
Borders	9	10	31,366	19,530	1,478	3,090
Northumberland	6	6	40	246	2,100	2,010
Cumbria**	3	4	0	17	800	730
Lancashire	8	8	9,650	31,960	0	0
Humberside	-	-	-	-	-	-
Lincolnshire	6	5	15	168	0	0
Norfolk	4	4	2,010	10,350	380	430
<b>GRAND TOTALS</b>	<b>144</b>	<b>192</b>	<b>175,724</b>	<b>194,752</b>	<b>76,286</b>	<b>114,678</b>

- no count

\* includes Bearsden & Milngavie, Clydebank, Cumbernauld & Kilsyth, Cumnock & Doon Valley, Dumbarton, East Kilbride, Eastwood, Glasgow city, Hamilton, Inverclyde, Kilmarnock & Loudoun, Kyle & Carrick, Monklands, Motherwell, Renfrew and Strathkelvin.

\*\* note that counts from the Solway Firth are included in Annandale/Eskdale even though some of the geese feed and roost on the Cumbrian side of the estuary.

**Table 3. Gross regional distribution of Pink-footed and Greylag Geese in Britain in October and November 1990. The regions used are defined below. Note that the October values are given as a percentage of the November total, so that the differences between the two values for any region are real and not an artefact of the different totals for the two months.**

	Pink-footed		Greylag	
	Oct	Nov	Oct	Nov
N Scotland	0.3	0.6	29.6	26.8
NE Scotland	9.5	21.6	12.9	38.8
EC Scotland	38.0	30.2	15.2	15.9
SE Scotland/NE England	31.5	21.2	4.5	6.7
SW Scotland/NW England	6.4	4.2	5.8	11.4
W England	5.0	16.7	0.0	0.0
E England	1.1	5.5	0.4	0.4
	91.8	100.0	68.4	100.0

Scotland: Islands, Highland, Moray

NE Scotland: Banff and Buchan, Gordon, Kincardine and Deeside

EC Scotland: Tayside, Central, Fife

SE Scotland/NE England: Lothians, Borders, Northumberland

SW Scotland/NW England: Strathclyde, Dumfries & Galloway, Cumbria

W England: Lancashire, Merseyside

E England: Humberside, Lincolnshire, Norfolk

#### *Principal sites*

Of the areas checked for geese, only fourteen supported more than 5,000 Pink-feet in either October or November. The peak counts (all October unless stated otherwise) made in these areas were as follows: Loch of Strathbeg (37,100 in November), Ribble Estuary (20,700 in November), West Water Reservoir (21,300), Aberlady Bay (17,500), Loch Leven (16,000), Montrose Basin (12,700 in November), Hule Moss (10,030), Carsebreck/Strathallan (9,900), Snettisham (9,300 in November), Dupplin Lochs (8,200), Solway (7,259), Martin Mere (6,365 in November), Haddo Country Park (5,900), Loch Tullybelton (5,500) and Fala Flow (5,500). The Aberlady count was an all-time record for the site.

For Greylags, four areas held more than 5,000 individuals: Loch Eye (16,607 in November), Dinnet Lochs (15,989 in November), Loch of Skene (15,764 in November) and Loch Spynie (6,100 in October).

Whilst these single counts go some of the way towards highlighting the significance of particular sites to geese, their importance is not fully assessed by the results of the national census alone. For example, a rapid turnover of geese occurred at particular sites, due at least in part to a clean and early harvest in several areas. There are numerous examples. At Dupplin Lochs, there were 42,000 Pink-feet on the 7th October, but only 8,200 on the October and 5,470 on the November count dates. In the Borders, West Water Reservoir held 23,500 Pink-feet at the end of September and 24,700 on the 6th/7th October, somewhat higher than the 21,300 and 12,430 recorded on the October and November count dates respectively (A.W. Brown, In litt.). At nearby Hule Moss (Borders), a similar pattern of declining numbers was observed, the magnitude of the reduction being 16,755 at the end of September and only 6,100 on the 10th/11th November (R. Murray, In litt.). The importance of

these, and other, sites as arrival points for geese in the autumn has already been highlighted, both in previous reports and by the extensive counts made by goose counting teams in the Borders and Lothians, and by the Central Scotland Goose Group (e.g. Newton *et al.* 1990). It is clear that site assessments could be greatly improved by having numerous counts available for a particular site, made throughout the autumn to spring period, rather than relying on one or a few counts made around the time of the census. This represents a high priority for the future.

#### *Breeding success*

The proportion of young Pink-feet (21.5%) observed in sample flocks (Table 4) shows a return to what appears to be a normal level of breeding success after a poor year in 1989 (13.0%). Although the figures show some regional variation, this is almost certainly partly due to differences in flock size, habitat in which the geese are feeding and observer differences. This may well apply to regional differences in brood size also, which was measured as 2.22 overall in 1990 compared with 1.72 in 1989. Whether there are real regional differences in the settlement patterns of successful, versus unsuccessful, breeders has yet to be tested rigorously. Interestingly, compared with 1988, when the proportion of young birds in flocks was similar (21.5% in 1990 and 23.5% in 1988), brood size was considerably smaller (2.22 in 1990 compared to 3.19 in 1988), suggesting that the birds that bred in 1990 were individually less successful than in 1988. The maximum brood size recorded in 1990 was 6 young, with two broods of this size being found.

Table 4. The proportion of young and average brood size in Pink-footed and Greylag Goose flocks in autumn/early winter 1990. The regions used are defined in Table 3.

		No. of flocks	Total aged	% Young	No. of broods	Brood size
Pink-footed	N Scotland	2	700	19.1	38	2.47
	NE Scotland	6	2,401	20.4	75	2.32
	EC Scotland	13	5,267	23.4	111	2.28
	SW Scot/NW Eng	15	2 861	18.6	110	2.08
	E England	7	1,487	23.2	36	2.03
	<b>Total</b>	<b>43</b>	<b>12 716</b>	<b>21.5</b>	<b>370</b>	<b>2.22</b>
Greylag	N Scotland	6	1,591	20.6	73	2.49
	NE Scotland	5	1,522	24.5	60	2.50
	EC Scotland	3	176	27.8	12	2.50
	SW Scot/NW Eng	4	708	11.7	3	3.00
	<b>Total</b>	<b>18</b>	<b>3,997</b>	<b>20.7</b>	<b>148</b>	<b>2.51</b>

The proportion of young Greylags in 1990 (20.7%) also reflects a relatively good breeding season for them, and compares with 12.3% in 1989 and 22.5% in 1988. Although the number of Greylags aged in 1990 was smaller than for Pink-feet, the brood size shows a remarkable degree of consistency between most regions, and was calculated at 2.51 young/pair overall.

## CONCLUSIONS

Although it would be wrong to draw too many conclusions from this first year of two counts, it appears to have only been moderately successful in that the highest numbers of both species were recorded in November, the time when the annual census traditionally takes place. Indeed, it would appear that an equally comprehensive national count of Pink-feet can be obtained in either October or November, though it may be necessary to cover more sites (and thus use more observers) in November than in October to achieve a similar result. An October count alone would not be desirable for Greylags though, as only part of the population is present by that time. Thus, in order to estimate total population sizes of both species, we need to continue with the November census (which will also ensure continuity with previous national censuses) and supplement it with an earlier census. Also, we must continue to search for concentrations of geese in Iceland, especially for Greylags. If such concentrations exist then we have the option to count them. However, it may be that the geese are widely dispersed across the interior of Iceland in the autumn, and thus impractical to census.

We must also give some consideration as to whether we are searching for geese that don't really exist! Are we really grossly under-estimating the real population size of each species? A newly agreed contract between the Trust and the British Association for Shooting and Conservation, including the assessment of annual shooting kills of Pink-feet and Greylags, will enable us more accurately to assess the contribution that hunting makes to overall mortality in the two species. With such information to hand, it may be possible to re-examine the precise nature of the observed population expansion.

Finally, site assessments are an important part of our remit and current obligations to the sponsors of the National Wildfowl Counts programme. These can be greatly improved by obtaining more frequent counts, particularly from the most important sites. Also, regular visits to key sites at relatively short time intervals, especially in autumn and spring, would facilitate a better understanding of goose movements, both within and to and from Great Britain.

These considerations will be taken up again in designing our monitoring strategy for the future.

## REFERENCES

Kirby, J.S. 1990. Thirty years of counting Pink-footed and Greylag Geese in Britain: history, current procedures and proposals for the future. Internal report, WWT, Slimbridge, 9pp.

Kirby, J.S. & Salmon, D.G. 1990. National census of Pink-footed and Greylag Geese in Britain, November 1989. Report to NCC, WWT, Slimbridge, 6pp.

Newton, S.F., Bell, M.V., Brown, A.W. & Murray, R. 1990. Pink-footed Goose numbers at arrival sites in eastern and central Scotland. *Scottish Birds* 16: 35-36.

Salmon, D.G. 1989. Pink-footed and Greylag Geese in Britain, November 1988. Report to NCC, WWT, Slimbridge, 4pp.

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